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NATO INTERNATIONAL CONFERENCE ON EXPERIMENTAL &
BEHAVIORAL APPROACHES TO ALCOHOLISM

JACK A. ADAMS

25 JANUARY 1978

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problems associated with some of the topics are examined.

NATO INTERNATIONAL CONFERENCE ON EXPERIMENTAL AND BEHAVIORAL
APPROACHES TO ALCOHOLISM

The international conference, "Experimental and Behavioral Approaches to Alcoholism," was held in Os, Bergen, Norway, 28 August to 1 September 1977 under the auspices of NATO. The term "behavioral" in the title is revealing of the viewpoint held by most of the conferees. To psychologists, the term "behavioral" in this context connotes behavior modification techniques that have arisen from the behaviorism of B.F. Skinner (Harvard University) and his emphasis on applying the principles derived from experimental investigations of learning. The scientific philosophy of behaviorism, as a sternly objective point of view in psychology, goes back to the beginning of this century, and the experimental study of learning goes back even further, but it was Skinner in recent times who forcibly argued for the merger of behaviorism and the principles of learning into an applied discipline. The practical applications of any scientific area will be modest in its early stages as it strives to define its variables and establish laws, but as the area matures, and the main variables are identified and the laws established, there is power for change on behalf of the common good. The psychology of learning has followed this standard course. By the 1950s Skinner was contending that the principles of learning were strong enough to accomplish behavioral change wherever it was socially desirable to do so—the home, the classroom, the clinic. This effort in the psychology of learning goes by the generic name of behavior modification, and by the particular name of behavior therapy when the concern is change in the maladaptive behavior that is sought by clients who show up at psychological clinics. Whatever the name, behavior modification has one axiom that separates its practitioners from other kinds of psychologists and from psychiatrists: Unacceptable behavior is primarily learned, and so it can be extinguished and replaced with more acceptable behavior. Within the context of therapy for alcoholic behavior, Miller² (pp. 656-657) wrote about behavior therapy this way:

"Although empiricism is stressed, behavior therapists tend to view alcohol abuse within a social-learning model. Within this model, alcohol abuse is

'viewed as a socially acquired, learned behavior pattern maintained by numerous antecedent cues and consequent reinforcers that may be of a psychological, sociological, or physiological nature. Such factors as reduction in anxiety, increased social recognition and peer approval, enhanced

ability to exhibit more varied spontaneous behavior, or the avoidance of physiological withdrawal systems may maintain substance abuse'. (Miller & Eisler, 1975)

Therapeutic goals within this framework include (a) a detailed assessment of the specific antecedent and consequent events related to the excessive use of alcohol, (b) the use of social-learning treatment procedures to teach social skills that can serve as alternatives to abusive drinking, (c) the rearrangement of consequences for both excessive drinking and sobriety within the community environment, and (d) the short and long term evaluation of the effects of the intervention program using objective measurement procedures."

An important corollary of the behavioral approach is rejection of the medical disease model. Alcoholism is not a disease whose causes and cures can be discovered, as with smallpox, but is inadequately learned behavior that can be replaced with more acceptable behavior. A neurotic can be retrained to behave satisfactorily, just as a coach can retrain a bad golf swing, and this is how an alcoholic is seen. For one reason or another, alcoholics have learned modes of responding that are hurtful to themselves and others, and they can be retrained away from damaging amounts of alcohol. The medical model was emphasized in a major address at the Conference by M. Keller (Rutgers University) who believes in a disease of alcohol addiction, and who thinks that good diagnosis of the disease must precede treatment and that behavioral psychologists should work with M.D.'s in focusing on the disease of alcoholism. Behavioral psychologists, he said, should concentrate on the behavior problems associated with drinking (this is the implied argument, heard before, that behavioral psychologists treat symptoms, not causes).

The Conference themes were seven: Research methodology, and six empirical topics: Alternative skills training, self-management procedures, the tension-reduction hypothesis, learning to discriminate blood-alcohol level, conditioned taste aversion, and individual differences. Each of these areas will be reviewed.

RESEARCH METHODOLOGY

A laboratory experiment on alcohol might be designed something like this: An experimental group receives alcohol and has its performance measured on a criterion task. A control group performs on the criterion task without a prior experience of alcohol. The performance inferiority of the experimental group with respect to the control group, if any, represents

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the effects of alcohol. A theme of the Conference was that this traditional experimental design is inadequate because it does not consider the expectancy effect. The leading analyst at the conference of the expectancy effect was A.R. Lang (University of Wisconsin-Madison) who gave an excellent paper on it. His paper was derived from the empirical work which he and his colleagues conducted on alcohol and aggression¹. There is the common belief that a strong relationship exists between the consumption of alcohol and aggressive behavior, and it is Lang's position that the experimental proof of this thesis cannot be made with a simple control vs experimental group design. Rather it is necessary to consider also the behavior that arises from the belief that alcohol has been consumed. This is the expectancy effect, and an effect of alcohol can be presumed only if performance under the effect of alcohol is worse than performance based on belief in the effects of alcohol. Lang recommends a 2×2 factorial design, with four groups of subjects:

		<u>EXPECT ALCOHOL</u>	
		YES	NO
<u>RECEIVE</u> <u>ALCOHOL</u>	YES	GROUP 1	GROUP 2
	NO	GROUP 3	GROUP 4

Group 1 would be told that they were receiving alcohol in their drinks and would actually receive it. Group 2 would be told that they would receive no alcohol but in actuality would receive it. Group 3 would be told that they were receiving alcohol but would not receive it. And, Group 4 would be told that they would not receive alcohol and, in truth, would not be given it. A camouflaging mix in the drink, like fruit juice, would carry out the deception when it is required. Lang *et al*¹, using this experimental design, found only an expectancy effect, not an alcohol effect, for aggressive behavior. Subjects who believed that they had consumed an alcoholic beverage behaved more aggressively than subjects who believed that they had consumed a nonalcoholic drink whether they did or not. G.T. Wilson (Rutgers University) reported a similar study on alcohol and sexual behavior. There is the common belief that drinking and sexual aggression are positively related, and Wilson studied this assertion by measuring penile tumescence while his subjects viewed a film

of forcible rape. The 2×2 factorial design urged by Lang was used, and a significantly greater sexual response was found for those who believed that they had consumed alcohol, not for alcohol consumption per se. Once again the expectancy variable was confirmed. It would appear that Lang's recommendations are on sound turf, and that the 2×2 factorial design, or a derivative of it, will be a requirement for research of the future.

ALTERNATIVE SKILLS TRAINING

Alternative skills training is a treatment technique which assumes that alcoholics have limited skills to cope with certain interpersonal problems, and this inability is the root cause of their difficulties. P.M. Miller (Hilton Head Hospital, South Carolina) was the proponent of this approach at the Conference. The answer, he contended, is assertiveness training that teaches an alcoholic to express his rights and negative feelings. He reported an experiment where either a scene that required assertiveness or a neutral scene (the control condition) was described to alcoholics and non-alcoholics. Drinking was allowed for all subjects after the scene was described. Alcoholics were found to drink more after the assertiveness scene than after the neutral scene, and more than non-alcoholics. In the same vein, Miller cited a case history of a hotel clerk who drank heavily because he could not confront housekeeping personnel about their poor work. In therapy sessions Miller's clients are taught to speak frankly, to speak up directly, and to speak with forcefulness. After treatment, the clients report more self-confidence and control over their drinking, although success is not total. Some continue to have problems because they have expectations of failure when they assert themselves.

SELF-MANAGEMENT PROCEDURES

Miller also recommended the self-management technique for alcoholics, which is a technique used elsewhere in behavior therapy. The client is trained to monitor on a recording sheet his own drinking behavior and the situations in which it occurs. The acts of recording presumably produce an awareness of drinking patterns and give the drinker the information with which to re-arrange his social behavior and avoid those situations that aggravate his drinking.

THE TENSION-REDUCTION HYPOTHESIS

The tension-reduction hypothesis says that alcoholics have more body tension than non-alcoholics, and so they drink to reduce the tension. Methods of reducing the tension, and

thus the drinking, could be worked out if the hypothesis is true. The research that was reported featured the recording of muscle action potentials as an index of tension, and biofeedback as information about the amount of the tension. Knowledge of one's own tension should be instrumental in reducing it, is the contention.

In a word, the experiments that were reported were a mix of preliminary and inconclusive findings. Perhaps a reason that the hypothesis remains unresolved is that the hypothesis appears to be poorly rationalized, or so it seemed from the research that was reported. There was the impression that the investigators believe that muscle tension *per se* is a determinant of excessive drinking, however it is just as reasonable to contend that muscle tension is a surface manifestation of underlying anxiety and it is the anxiety that should be treated.

LEARNING TO DISCRIMINATE BLOOD-ALCOHOL LEVEL

Do alcoholics get drunk before they know it because they have not learned to discriminate the internal sensory cues associated with drunkenness? Experimental programs on this discrimination hypothesis were reported by P.E. Nathan (Rutgers University), and by V.J. Adesso and J.S. Henning (both of University of Wisconsin-Milwaukee). The paradigm is to give a subject in the laboratory alcoholic drinks, periodically test his blood-alcohol level and, at the same time, ask him to estimate his blood-alcohol level on the basis of his perception of internal sensory cues. The actual blood-alcohol level, or a measure derived from it, is then reported to the subject as his knowledge of the results. Nathan found that the accuracy of estimating blood-alcohol level increased with trials having knowledge of results, and decreased when knowledge of results was withdrawn. Nathan's trends were very much like those found in any human verbal or motor learning situation, and taken at face value they represent learning about the sensory cues associated with alcohol. The learning effect was less evident in the study by Adesso and Henning.

At present the main problem is not the truth or falsity of the discrimination hypothesis, but whether learning about the internal sensory cues associated with drinking occurs at all. In a typical experiment the subject will be pre-acquainted with the experimental procedure, and then will be given several drinks and will have several test trials during a session. Now a subject will know from common knowledge and the pre-acquaintance procedures that his blood alcohol level will increase as time passes, and so on successive tests it is reasonable to expect him to give higher and higher estimates of his blood alcohol

level. Because his actual blood alcohol level is increasing, the estimated levels and the actual levels are changing in the same direction, and it would be easy to infer a learning effect particularly if a subject used the knowledge of results to regulate the rate of increase in his estimates on successive tests. But the effect would be only learning-like, having nothing to do with learning to discriminate the sensations associated with drinking. The experimental solution to this problem is to give only one drink a day in an unspecified amount, and have only one test at an unspecified time after the drink. The subject would not then be able to infer what his blood alcohol level might reasonably be.

The discrimination hypothesis is a matter of perceptual learning, where the subject must learn to discriminate between the body sensations associated with drinking from other body sensations, and to refine appreciation of them. In an experiment on the discrimination hypothesis the subject will report on his blood alcohol level, and the knowledge of results delivered after the report is assumed to produce learning the sensations associated with drinking. If this is the case, then the paradigm is truly one of perceptual learning, but it is also possible that knowledge of results affects only the verbal report, not the appreciation of sensations, and so it is a verbal learning experiment, not a perceptual learning experiment. There is a chain of two response classes—body sensations and the verbal report. Which one is affected by knowledge of results? In a perceptual learning situation where the stimuli are external to the subject, tests can be devised to assess discrimination of the stimuli independent of any verbal responses about them, but how to conduct such tests when the stimuli are internal is not apparent. There can be no appraisal of the discrimination hypothesis until this alternative explanation is confronted.

CONDITIONED TASTE AVERSION

Pair a flavor with a sickness experience and there will be avoidance of the flavor. As few as one pairing of the flavor and the sickness can be sufficient to induce the avoidance behavior. This paradigm is the definition of conditioned taste aversion, and it has been of considerable theoretical interest in experimental psychology during the past 10 years because it is different from conventional Pavlovian conditioning of salivation, eye blink, etc. In conventional Pavlovian conditioning the conditioned and unconditioned stimulus must be paired a number of times before conditioning occurs, and the two stimuli must be temporally close (seconds) or overlapping for conditioning to take place. In conditioned taste aversion, however, the conditioning can occur with only a single pairing of the conditioned and unconditioned

stimulus, and a long delay (hours) between them will leave the conditioning process unaffected. Moreover, conditioned taste aversion extinguishes more slowly than a conventional Pavlovian conditioned response.

Almost all of the research on conditioned taste aversion has been with animals, but its translation to the human problem of alcoholism is straightforward: Pair liquor with a sickness experience and the subject should avoid liquor. C.S. Mellor (Memorial University, Newfoundland), was attracted to this possibility for alcoholics. His approach was to associate the experience of alcohol with an administration of lithium carbonate, a substance which in large amounts will kill but in small amounts will only make the subject sick. His subjects were 25 acute alcoholics. Sixteen were made nauseous with lithium carbonate, but only nine of these had conditioned nausea where the taste of liquor made them sick. Abstinence for six months was achieved for the nine—a modest outcome considering the success that animal psychologists have had with this technique. The hazards of lithium carbonate make it unlikely that the substance will be useful for routine therapy, so in his current research, Mellor is using a small human centrifuge as a harmless way of inducing motion sickness. The data-collection phase of his experiment with the centrifuge is unfinished.

The most interesting experiment of the conference, and perhaps the most important, was reported by R.L. Elkins and R.P. Murdock (Veterans Administration Hospital, Augusta, Georgia). The experimental paradigm was conditioned taste aversion, or an analogue of it, and it was entirely cognitive; no use was made of strong chemicals or devices such as a human centrifuge. They had their alcoholic clients imagine all of the sensory dimension of drinking, and then imagine nauseous sickness (they report that actual illness can be induced in 90% of their clients by having them imagine it). Imagining the sensory associations of drinking is the conditioned stimulus, and imagining the sickness is the unconditioned stimulus that arouses sickness as the unconditioned response. When the conditioned stimulus and the unconditioned stimulus are paired a sufficient number of times, conditioning emerges, and the occurrence of the conditioned stimulus then produces anticipatory sickness as the conditioned response; the mere imagining of the sensations that accompany drinking produces nausea. Elkins and Murdock reported a demonstration study that used 35 alcoholics. After the conditioning procedure, 16 showed conditioned nausea with an average of 15 months' abstinence. Six others who were made nauseous but failed to condition averaged only 3.7 months' abstinence. The rest of the subjects had to be dropped for miscellaneous reasons. These findings are provocative and point to a useful therapeutic method, although

control subjects must be included in the assessment to make a convincing case for this cognitive version of conditioned taste aversion (the control subjects are now being run). Also, these data urge a theoretical effort to bring imagery and conditioning closer together. So far in psychology, imagery has not embraced conditioning, nor has conditioning had imagery as one of its explanatory mechanisms.

INDIVIDUAL DIFFERENCES

The major paper on individual differences was given by J.L. Horn (University of Denver). The clients who came to the alcoholic's clinic of a hospital were subjects in a research program that used questionnaire data. Responses to questionnaires were factor analyzed, and various scales were derived that measure such dimensions of alcoholic behavior as amount of daily drinking, and reasons for the drinking.

The difficulty with this kind of research is that self-report questionnaire data are unreliable—people cannot always be relied upon to produce accurate information about themselves. Subjects who come to an alcoholic's clinic may deliberately understate their drinking behavior because they feel guilty about it, or they may deliberately overstate it because they are desperate for treatment. Nor is the human memory up to accurate recollection of all the aspects of drinking behavior that have occurred over the years, particularly when its powers have been attenuated by excessive alcohol. Notwithstanding, scales derived from research of this kind may provide some useful information for the therapeutic process.

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